

Behavioural Activities of Friesian and Janubi Cows in Southern Iraq During the Mild Weather

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THREE DAYS of continuous observation from 8.00 a.m to 5.00 p.m method was tried to study the behaviour of 2 Friesian and 3 Janubi cows kept in stalls of space enough for all normal activities. The observations revealed more stabilized physiological responses in term of rectal temperature, pulse rate and respiration frequency both between two points of record and amongst individual cows of Janubi breed. The Friesian cows utilized more of their available time on feeding, ruminating, and standing, while Janubi cows spent more time on laying. The frequency of activity by cows of both breeds on drinking defecating and micturition was of the same magnitude.

It is thus concluded that stall fed cows of these two breeds available in Southern Iraq must be provided with feed in two unequal portions, the larger being offered during 9 : 00 - 10 : 00 A.M. All behaviour patterns of Janubi cows seems to be well established and can form a basis for comparison with imported cows. It can be also concluded that the method of continuous observations is best suited for behaviour studies is a stall fed animals as compared to intermittent one used in grazing animals

Breeds differ genetically in their quantitative and qualitative characters according to the specific goals of the breeders and according to the prevailing environments they were originated or transferred to. The maximum expression of the genetical potentialities of these characters depends mainly on insuring the optimal requirements for such animals concerning all the environmental sections. Dairymen in Southern Iraq do not get efficient production from Friesians as laid down by the genetics due to their inability to recognise the behavioural changes and their needs inability to recognise. In fact, the reduced performance of these cows are not solely due to climatic stress, but also due to recognize their behavioural reactions in their normal life, such as feeding, drinking, ruminating, resting and excretion behaviour. All such functions coordinated with the time available to these animals during the day and consequently causes metabolic modifications in terms of body temperature, pulse rate and respiration frequency.

Many studies are available in the literature on the behaviour pattern of grazing cattle leading to adequate solutions of pasture management problems, (Fisher, *et al.*, 1954 ; Dutch Worth and Shirlow, 1958 and Hancock ; 1955). Lofgreen *et al.* (1957) used silage feeding method in sheep and cows and compared with grazing. They reported an agreement on feeding behaviour with different intervals of observation. Most of these studies are in fact directed to find out the optimum observation intervals to minimize time and labour of managerial occupation. Hull *et al.* (1960) compared continuous and intermittent observations in behaviour with grazing stress and established 30 min interval as uniform time to the animals to show a change in behaviour. They further suggested that a greater number of animals were needed to make universal rules due to such variation in individual animals.

However, very scant work is reported on the stable fed animals and data on comparative values of these two Friesian and Janubi breeds of dairy animals are not available.

Hence, a preliminary investigation was instituted on Friesian and Janubi cows for evolving a sound policy on managerial practices to allow time needed to these animals for optimum activities.

Materials and Methods

Five adult dairy cows (2 Friesian and 3 Janubi) were obtained from the Agriculture Research Station, Basrah, Iraq. This station is a true representative of Southern Iraq climate. These animals were subjected to continuous observations for three consecutive days from 8.00 a.m. to 5.00 p.m. daily assuming that no feeding was done after 5.00 p.m. One observer was put for each individual cow separately. All usual provisions on fixed time for feeding, watering and care were made available. The animals were placed in a shed of about the size to allow adequate space for all pastoral and behavioural activities ad libitum. Records of ambient and body temperature, pulse rate and respiratory frequency were maintained on diurnal basis *i.e.* 10.00 a.m. and 3.00 p.m. Observations on the time taken by individual animals for feeding, ruminating, sitting and standing were recorded in min in each hr interval. Frequency of time consumed for drinking in minutes in each hour interval. Frequency of time consumed for drinking, defecations and micurition were also maintained in similar manner.

Efforts were made to avoid disturbance to the animals by prohibiting unusual entry of attendants and keeping off flies. The ambient temperature was recorded every day at 10 : 00 a.m. and 3 : 00 p.m. as $32.7^{\circ}\text{C} \pm 1.21$ and $33.7^{\circ}\text{C} \pm 1.21$, and 33.7°C respectively with the difference of 1°C .

Results and Discussion

Physiological reactions

As evident from Table 1 a, rectal temperatures of Friesian cows at 10 : 00 a.m. and 3 : 00 p.m. were averaged 38.3 ± 2.16 and 38.5 ± 1.14 centigrades while those of Janubi cows were 38.5 ± 0.20 and 38.8 ± 0.7 respectively.

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The variations in body temperatures between the two breeds showed that the Janubi was far lower than the Friesian, while Friesian individuals showed higher individual differences than in the Janubi. However, the diurnal variations in body temperature was almost same in the cows of two breeds. This may be due to the low diurnal variations in ambient temperature ($\pm 1^\circ\text{C}$). It can be concluded that Janubi cows are of higher body temperature, with least individual variation from Friesian, while the two breeds showed that diurnal changes.

Pulse rate in min for Friesian at 10 : 00 a.m. and 3 : 00 p.m. was 59 ± 2.19 and 63 ± 1.68 respectively, while in Janubi the values were 30 ± 0.94 and 63 ± 0.82 for the two tests respectively, Table (16). The high pulse rate in Janubi especially at 10 : 00 a.m. which accompanied low individual variation, indicate that these Janubi cows were more adapted to the conditions of this area than the Friesian.

TABLE I. a Values of rectal temperature during three consecutive days (4-3-75 to 6-3-75).

Time	Friesian		Janubi			Date
	1	2	1	2	3	
10 A.M.	38.6	38.6	38.5	38.7	39.2	4-3-75
3 P.M.	38.8	38.6	38.9	39.0	39.2	4-3-75
10 A.M.	38.0	38.1	38.2	38.4	38.6	5-3-75
3 P.M.	38.3	38.5	38.6	38.6	38.8	5-3-75
10 A.M.	38.1	38.5	38.2	38.3	38.5	6-3-75
3 P.M.	38.1	38.8	38.5	38.6	38.7	6-3-75
Mean at 10 A.M. .	38.3 ± 2.16		38.5 ± 0.20			
Mean at 3 P.M. .	38.5 ± 1.14		38.8 ± 0.74			4-3-75
Differences 10 A.M. and 3 P.M	0.2		0.3			to 6-3-75

The records of the respiration rate in Table 1 c, showed higher rate in Friesian *i.e.* 32 ± 3.6 and 39 ± 2.55 per min as compared to that of Janubi *i.e.* 29 ± 1.97 and 34 ± 2.26 at 10 : 00 A.M. and 3 : 00 P.M. respectively. Tendency for smaller variations between individual and between the diurnal records remained the same. The Janubi cows seemed to be more stabilized in gaseous exchange than Friesian, and hence showed slower diurnal variation in respiration rate.

TABLE 1 b. Values of pulse rate per min during three consecutive days (4-3-75 to 6-3-75).

Time	Friesian		Janubi			Date
	1	2	1	2	3	
10 A.M	56	55	62	60	64	4-3-75
3 P.M	60	60	64	64	68	4-3-75
10 A.M	56	56	60	56	60	5-3-75
3 P.M	60	60	64	60	64	5-3-75
10 A.M	68	64	56	60	64	6-3-75
3 P.M	68	68	60	64	64	6-3-75
Mean at 10 A.M	59 ± 2.18		60 ± 0.94			4-3-75
3 P.M.	63 ± 1.68		63 ± 0.82			
Difference 10 A.M and 3 P.M	4.0		3.0			to 6-3-75

TABLE 1 c. Values of respiration rate per min during three consecutive days(4-3-75 to 6-3-75).

Time	Friesian		Janubi			Date
	1	2	1	2	3	
10 A.M	28	26	24	28	28	4-3-75
3 P.M	32	32	28	32	32	4-3-75
10 A.M	28	40	28	28	20	5-3-75
3 P.M	40	48	32	32	24	5-3-75
10 A.M	32	40	38	38	32	6-3-75
3 P.M	40	44	48	40	36	6-3-75
Mean at 10 A.M	32 ± 3.60		29 ± 1.97			4-3-75
Mean at 3 P.M	39 ± 2.55		34 ± 2.26			
Differences 10A.M. and 3 P.M	7.0		5.0			to 6-3-75

TABLE 2. a. Variation and mean in feeding, standing, sitting and ruminating during three consecutive days (4-3-75 to 6-3-75).

Name	Feeding			Standing			Sitting			Ruminating						
	4/3	5/3	6/3	4/3	5/3	6/3	4/3	5/3	6/3	4/3	5/3	6/3	Mean			
<i>Friesian</i>																
1. Roba . . .	276	330	260	288	480	495	410	462	60	45	130	78	45	70	122	79
2. Kafra . . .	221	235	195	217	490	440	430	453	50	100	110	87	75	80	80	78.3
<i>Janubi</i>																
1. Jakleen . .	196	228	183	204	480	392	357	410	60	148	183	130	56	67	97	73
2. Fifi . . .	162	185	215	187	415	360	377	384	135	180	163	150	90	52	83	75
3. Wahiba . .	215	185	148	183	446	430	437	437	94	110	103	102	45	65	64	58

Distribution of time for various behavioural activities

The average time utilised for feeding, ruminating, standing and sitting by Friesian cows was 253, 81, 461 and 661 and 79 min, while by the Janubi cows it was 190, 67, 409 and 131 min, per day respectively (Table 2 a and b) and (Fig. 1 and 2). The Friesian cows kept eating, ruminating and standing for longer time than Janubi who devoted more time to sitting idle. It might be due to less need of Janubi cows to fill in there volume for feed. Slower respiration rate may be accounted by less time for activity and a little more for idling is the shed.

TABLE 2 b. The average hourly distribution of feeding, ruminating standing and sitting times from 8. a.m. to 5. p.m. during three consecutive days (4-3-75 to 6-3-75).

Time interval	Friesian				Janubi			
	Duration in min.				Duration in min.			
	Feeding	Rumination	Standing	Sitting	Feeding	Rumination	Standing	Sitting
8-9	17	—	60	—	17	—	60	—
9-10	60	—	60	—	51	—	60	—
10-11	37	—	32	8	24	—	46	14
11-12	14	22	45	15	9	—	33	27
12-1	33	10	49	11	25	16	50	10
1-2	23	14	43	17	16	21	28	32
2-3	21	25	32	28	13	12	34	26
3-4	38	—	60	—	24	7	53	7
4-5	10	10	60	—	11	11	45	15
540	253	81	461	79	190	67	409	131
% time	47	15	85.4	14.6	35	12.4	74	26

Utilization of time for drinking and excretion

The Friesian cows went on the average 6.4 and 5 times and the Janubi took 6, 4 and 6 times each day for drinking, defecation and micturition functions respectively (Table 3). It is apparent that the frequency of these three activities is almost uniform in the two breeds during this period of three days under study.

Fig 1

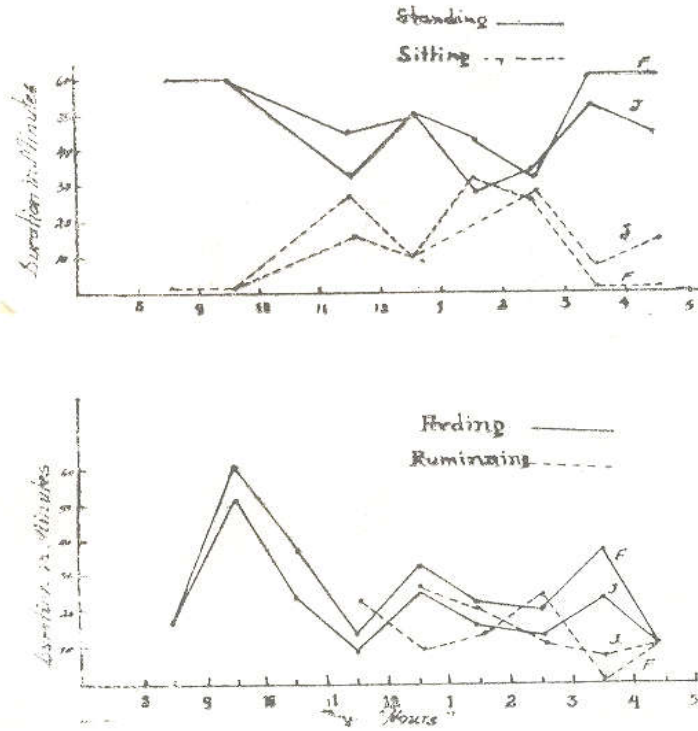


Fig 1. Diurnal Variation in behavioural items

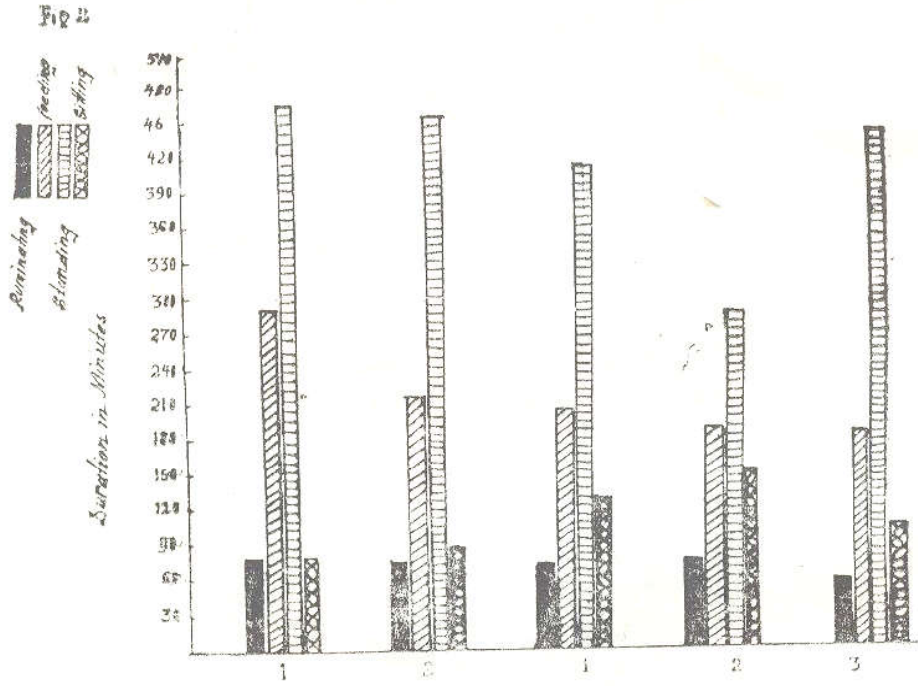


Fig 2. Length of behaviour items in the two breeds

TABLE 3. Numbers and mean in drinking, defecation, and urination for three consecutive days (4-3-75 to 6-3-75).

Name	Drinking			Defecation				Urination				
	4/3	5/3	6/3	Mean	4/3	5/3	6/3	Mean	4/3	5/3	6/3	Mean
<i>Friesian</i>												
1. Roba . . .	5	7	5	6	4	4	5	4	5	4	4	4
2. Kafia . . .	6	7	4	6	3	3	5	4	4	5	5	5
Mean . . .				6				4				4.5
<i>Janubi</i>												
1. Jakleen . .	8	8	5	7	3	5	6	5	6	5	7	6
2. Fifi . . .	7	5	5	5	4	4	3	4	7	4	7	6
3. Wahiba . .	8	5	4	6	—	2	4	2	—	2	3	2
Mean . . .				6				3.6				4.6

Conclusion

These results show that the local cows are better adapted to metabolic functions and developed less variation in all the three physiological responses like rectal temperature, pulse rate and respiration rate both amongst individual animals and between two times of test each day. As regards the time spent on various activities, these findings indicate greater time spent by Friesian cows on feeding, ruminating and standing while more time was spent on laying by Janubi cows. It seems that the local cows consume less and thus take less time for this activity and subsequent digestion of feed. More striking factor of this study is that feeding is done during all the hours under observation by both the types of cows. The longest being from 9-10 a.m. and 12-4 p.m. Rumination started after about 125 min of eating, and remained continuously until 5:00 p.m. This tendency of continuous feeding and rumination may be due to stall feeding of the animals. Such results however do not agree with those obtained on grazing animals (Tayler, 1954). He reported that greater times are spent on feeding and ruminating at night. The finding of Lofgreen *et al.* (1957) and Hull *et al.* (1960) on grazing cattle also can not be substantiated by this present result. They suggested intermittent observation methods. While in stall fed animals continuous observations method seems more guiding for behaviour studies. Thus, the conclusion for management practices can be drawn as :

1. Feeding of animals in this area can be done twice daily with larger portion of feed offered during 9 : 00 — 10 : 00 a.m.

2. As animals show continuous feeding and ruminating activity either standing or sitting, the space must not be a great problem.
3. Observation if made on behaviour pattern, should be on the continuous and not intermittent method.
4. Janubi cows would need for sitting more time than Friesian.

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سلوك الأبقار الفريزيان والجنوبي العراقي في البصرة

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درست هذا البحث سلوك الأبقار الفريزيان و الجنوبي العراقي بالنسبة
للتغذية والاجترار ومعدل الوقوف والراحة . وكذلك عدد مرات الشرب
والتبرز والتبول . كما تم تسجيل سرعة التنفس وسرعة النبض ودرجة
حرارة الجسم مرتان في اليوم ، في الساعة (١٠) صباحا والساعة (٣)
بعد الظهر خلال شهر مارس .

وقد تمت الدراسة على بقرتين فريزيان وثلاث بقرات عراقى جنوبى
موضوعة في مكان متسع يكفى لحركتها ونشاطها خلال ثلاثة أيام متتالية
(٣/٤ ، ٣/٥ ، ٣/٦) ابتداء من الساعة الثامنة صباحا الى
الساعة ٥ مساء وذلك في مزرعة وزارة الزراعة بالبصرة - العراق . ووجد
أن الأبقار الفريزيان تأخذ وقتا أطول في التغذية والاجترار والوقوف بالنسبة
للجنوبى . بينما الأبقار الجنوبى تقضى وقتا أكبر للراحة عن الفريزيان .
ومن هذه الدراسة اتضح أن رعاية الأبقار في الحظائر في جنوب العراق
تتطلب وضع التغذية لها على فترتين ، على أن تكون الكمية الكبيرة منها
الفترة الصباحية من ٦ - ١٠ صباحا . وظهر أيضا أن سلوك الأبقار
العراقية الجنوبية يثبت تأقلمها للمعيشة في جنوب العراق ، ويمكن
استعمالها لمقارنة الحيوانات الأخرى المستوردة وأن هذه الأبقار الجنوبى
لها صفات محددة خاصة بها يمكن أن تكون نوع منفصل وأن مجال التحسين
فيها مفتوح بدرجة كبيرة نظرا لتأقلمها للبيئة السائدة في جنوبى العراق ،
وهي تشبه في ذلك الى حد كبير الأبقار الهندية من حيث الصفات الشكلية .